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Systems Note 41

FIELD DEPENDENCE, INTELLIGENCE AND VISUAL DETECTION

by

G. T. LINTERN

AUSTRALIAN • DEFENCE • SCIENTIFIC • SERVICE

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Presently, The U.S. Army is investigating various methodologies to measure camouflage of the soldiers' uniform. Previously-used methodology to investigate this area would be most helpful when planning similar field trials. "Visual Search Process in Camouflage Detection" by M. G. King of the Australian Department of Defence refers to several studies throughout his report which describe methodologies used in several camouflage trials (Table 1). With limited references available, thisrequested article describing methodologies would benefit the U.S. Army by providing tested methodologies we can use to design an appropriate field trial, measuring camouflage of the soldiers' uniform, using moving and still camouflaged soldiers.

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SYSTEMS NOTE 41

FIELD DEPENDENCE, INTELLIGENCE AND VISUAL DETECTION

by

G. T. LINTERN

SUMMARY

Results obtained by other experimenters have demonstrated relationships between target detection performance and field dependence, and between target detection performance and intelligence. This Note reports an attempt to verify this earlier work.

During a series of field trials at Greenbank, Queensland, soldiers were set the task of detecting stationary targets in dense jungle. Their detection scores were correlated with their scores on tests of field dependence and intelligence. The data failed to support the earlier findings.

The detection tasks in this, and in two previous experiments, were similar in that stationary, camouflaged targets were used. However the detection tasks used in the two previous experiments correlated with tests of field dependence and intelligence, but the detection task used in this experiment did not. Research workers have generally assumed that a common factor contributes to performance over a wide variety of detection tasks. A general factor explanation is, however, not tenable for the data of this and other experiments. Research directed at defining factors that contribute to performance on particular detection tasks, and that can be measured independently of those tasks, may be more useful at this stage, than a search for a general target detection factor.

CONTENTS

1. INTRODUCTION

Visual target detection is an important facet of many military tasks. Nevertheless, minimal effort has been directed at assessing or enhancing the visual detection abilities of service personnel. In general, visual assessments within the armed forces are limited to testing colour discrimination and static foveal acuity. The efficiency of military tasks that are critically dependent on human visual detection could benefit from appropriate selection, training and assessment programs. Unfortunately, so little is known about the personality factors, behavioural patterns and visual characteristics that affect visual detection, that the development of such programs would be difficult.

The substantial differences that seem to exist both within and between inexperienced and experienced observer groups (Ref. 1 and note 1) indicate that research in this area could be worthwhile. Differences within inexperienced and experienced observer groups suggest that pre-training selection and post-training assessment would be useful. Furthermore, the substantial differences that apparently exist between inexperienced and experienced observers show that appropriate training procedures should be effective. Investigation of variables that discriminate between individuals of varying detection abilities and that correlate with detection performance in operational situations is now required. Ideally, some knowledge of the type of training that could enhance visual detection performance could also be acquired through such research.

A number of ability and personality characteristics are related to visual performance. Field independence; the ability to visually separate a simple object or pattern from within a more complex pattern; has correlated with target detection (Ref. 2), target identification (Ref. 1) and eye movement patterns (Ref. 3). Small but significant correlations have been found between intelligence and target detection (Ref. 2). Vigilance, which seems to be a substantial component of most visual detection tasks, is affected by motivation (Ref. 4) and by anxiety and stress resistance (Ref. 5).

Behavioural patterns can affect visual performance. The spontaneous patterns of visual fixation used by adults are different from, and apparently superior to those used by children (Ref. 6). The efficiency of spontaneous patterns of visual fixation varies even within adult groups (Ref. 3). Search methods can also affect detection performance (Ref. 7). Systematic search patterns are generally more effective than random search patterns (Refs. 8 and 9).

A number of characteristics of the visual system could affect detection performance; some of them being static and dynamic acuity for both the fovea and the periphery, night vision, extent of the visual field and movement threshold. The relationships between some of these variables and tasks with a substantial visual component, have already been documented (Refs. 10 and 11).

One or more of these personality factors, abilities, behavioural patterns or characteristics of the visual system may prove useful in selection, training, or assessment programs for visual detection.

At this stage, even the relationships of static foveal acuity and colour discrimination to visual detection, are uncertain. An Australian Army research team, in a recent series of field trials, examined some aspects of these relationships (Ref. 12). Members of Cybernetics Group at A.R.L. were consulted in the design of these field trials and, as a result of these consultations, were invited to suggest additional variables that could be examined within the existing organisational struucture of the trials. Field dependence and intelligence were chosen.

Note 1: During informal discussions with the author, pilots of the Australian Army Aviation Corps, who had served in the Vietnam conflict, said that a pilot's ability to detect camouflaged targets improved during the first four to ten weeks of operational experience and that both before and after this experience, substantial differences existed between pilots.

Witkin and his associates (Ref. 12) regard field independence as the ability to distinguish a target in an embedding, and therefore concealing, context. Such a skill would seemingly facilitate the detection of camouflaged targets. There is already evidence (Refs. 1 and 2), albeit meagre, that detection performance is related to field dependence. Some data showing an association between detection performance and intelligence are also available (Ref. 2). Field dependence and intelligence were chosen as additional variables for the Army field trials so that the generality of the previous observations could be tested and the association between field independence and detection performance that is implied by the descriptive similarity of the two concepts, could be verified.

This Note deals with the analysis of data on field dependence as measured by concealed figures tests, intelligence as measured by the Australian Army Group Classification test (AGC) and their correlations with target detection performance in the Army trials.

2. METHOD

2.1 Visual Target Detection

The visual detection trials were conducted at Greenbank, Queensland in June 1973.

Two detection lanes were constructed in jungle of medium density (see Fig. 1). Half of the subjects were tested on one lane and the remainder were tested on the other.

Tailor's dummies, clothed in Army jungle green uniforms, were used as targets (see Fig. 1). Fifteen dummies were distributed evenly over ranges between 12 and 57 metres from the viewing position. The radial directions of targets were randomly distributed within a 90° arc. Each target was exposed once by itself under each experimental condition to complete the testing for each subject. Exposures lasted for ten seconds and were separated by an interval of thirty seconds.

A wooden screen was located between the viewing position and the target area. When vertical, the screen blocked the subject's view of the target area (see Fig. 3). When the screen was horizontal, the subject could view the target area (see Fig. 4). The target area was divided into three adjacent radial sectors, the boundaries of which were marked by wooden stakes placed 20 metres from the viewing position (two are shown in Fig. 1). The boundaries of the sectors were also marked on the wooden screen and the areas between the markings notated A, B and C, so that when the screen was horizontal, the subject could verbally identify the sector containing the target (see Fig. 4).

Targets were raised and lowered while the screen was in its vertical position. Before an exposure commenced, the required target was raised, or, in the case of a blank exposure, no target was raised. Subjects wore earmuffs. The exposure commenced when the screen was lowered. Subjects were instructed to search the target area from the commencement of an exposure until its termination, or until they had detected a target. They were further instructed to point to any target that they detected and to name the sector that contained it. The subjects response and its latency were recorded.

Subjects were tested under both daylight conditions of 30 to 300 candela per square metre ambient luminance and simulated twilight conditions of approximately 0.01 candela per square metre ambient luminance. Twilight conditions were simulated by fitting subjects with neutral density filters. Light levels were monitored with a Spectra Pritchard Photometer.

Daylight and simulated twilight exposures were separated into two blocks of seventeen trials. Within each block of trials, the fifteen targets and two blank exposures were presented in random order.

The daylight and the simulated twilight trials were scored separately. Two scoring systems were used for each condition. Subjects were allocated a NUMBER score that was equal to the number of targets they detected, and a LATENCY score that was equal to the total time taken (in seconds) to detect the three nearest targets. Anyone who failed to detect all of the three nearest targets was not allocated a LATENCY score.

Further details of the field trials are available in Reference 12.

2.2 Field Dependence

The Hidden Patterns Test (HPT) and the Hidden Figures Test (HFT) from the Educa-

tional Testing Services kit for cognitive factors are measures of field dependence (Refs. 13 and 14). Each test is available in two forms. Both forms were administered to all subjects during the field trials. Total scores for each test were calculated by summing the scores from the two forms.

The instruction and practice pages of both tests are shown in Appendices 1 and 2.

2.3 Intelligence

All subjects had been routinely tested with the AGC soon after entering the Army. Their scores were obtained from their psychological test records.

2.4 Subjects

Subjects were selected from Regular Army personnel. All were under the age of thirty-five years.

The scores of subjects who failed to complete the target detection tasks or the field dependence tests, or whose intelligence scores were unavailable, were excluded from the analysis. The data of another subject were excluded from the analysis because he persistently gave a positive response on blank trials and frequently named the wrong sector on other trials. Only the scores of subjects whose visual acuity for each eye was 6/6 or better, were considered in this Note. The use of corrective lenses to achieve the acuity criterion was permitted. Scores for 75 of the 120 subjects who participated in the experiment were retained for the data analysis. Of those, only 71 were allocated a LATENCY score for daytime conditions and only 52 were allocated a LATENCY score for simulated twilight conditions.

3. RESULTS

All variables were tested for normality by the χ^2 goodness fit test. No significant deviations from normality were found. The product moment correlation was therefore selected as an appropriate summarising statistic.

The intercorrelations between HPT, HFT and AGC scores and NUMBER scores for both daylight and simulated twilight conditions, are shown in table 1.

TABLE 1

Intercorrelations between HPT, HFT and AGC scores and NUMBER scores for daylight and simulated twilight conditions. Data from 75 subjects were used for each correlation.

	HPT	HFT	AGC	Daylight	Twilight
HPT	·	0·53*	0·57*	0.02	—0·03
HFT		·	0·46*	0·13	0·13
AGC			·	—0·06	—0·16
Daylight			·	·	0·42*
Twilight					·

(* Significant at the 0·01 level.)

The correlations of HPT, HFT and AGC scores with the LATENCY scores for daylight and simulated twilight conditions are shown in table 2. The correlation between the two LATENCY scores is also shown.

TABLE 2

Correlations of the HPT, HFT and AGC scores with the LATENCY scores for daylight and simulated twilight conditions and the correlation between the two LATENCY scores. Data from 52 subjects were used for each correlation involving the detection scores for simulated twilight conditions. Data from 71 subjects were used for the other correlations in this table.

	HPT	HFT	AGC	Twilight
Twilight	—0·13	—0·06	0·04	·
Daylight	—0·13	—0·18	—0·01	0·45*

(* Significant at the 0·01 level.)

The reliability data are shown in table 3. The reliability coefficients for the field dependence tests were computed from data gathered during the Army trials, and are of the parallel forms type (Ref. 15). They have been corrected for test length. The scores of all subjects who completed the field dependence tests were used in the calculation of these reliability coefficients. The AGC reliability coefficient is a measure of internal consistency, and was obtained from Reference 16. The only suitable reliability estimates for the detection tasks were the correlations between daylight and simulated twilight scores. These estimates are, therefore, of the parallel forms type.

TABLE 3
Reliability coefficients.

	Reliability	Number of Subjects
HPT	0·92*	117
HFT	0·70*	117
AGC	0·94*	>1000
NUMBER	0·42*	75
LATENCY	0·45*	50

(* Significant at the 0·01 level.)

Scores were obtained for seven variables. The means and standard deviations of scores on each of the variables are shown in table 4.

TABLE 4
Means and standard deviations of scores on variables considered in this Note.

	Mean	s.d.
HPT	72·3	17·7
HFT	8·8	5.4
AGC	14·0	3·1
NUMBER (Daylight)	7·8	1·8
NUMBER (Twilight)	5·0	2·1
LATENCY (Daylight)	10·6s	3·7s
LATENCY (Twilight)	12·8s	4·5s

4. DISCUSSION

The data do not demonstrate any relationship between field dependence and target detection or between intelligence and target detection. Reliability coefficients and standard deviations for all tests were sufficiently high to expect that any existing relationships would have been reflected in the data.

Other researchers have demonstrated relationships between variables similar to those examined here. Bucklin (Ref. 3) reported significant correlations of 0·36 between the Hidden Figures Test (HFT) and target detection and 0·26 between intelligence and target detection. He failed however, to show a significant relationship between the Hidden Patterns Test (HPT) and target detection or the Thurstone Concealed Figure Test and target detection. Bucklin noted that the HFT and the intelligence test were not critically dependent on speed of working and in that respect, were similar to his detection task. A distinction between power and speed tests has been made elsewhere (Ref. 15). A power test is one in which the difficulty of items increases throughout the test. Extra time usually does not help the testee increase his score substantially. Intelligence tests are generally of this type (Ref. 15), and a superficial inspection of the HFT and Bucklin's detection task suggest that they too, are power tests. In contrast, the HPT and the Thurstone Concealed Figures Test seem to be speed tests in that item difficulty appears to be constant throughout the test. Extra time would probably allow most testees to improve their scores substantially. Speed could, therefore, be an important discriminating factor between perceptual tasks.

Support for this idea is available from other research. Thornton et al (Ref. 1) found significant and substantial correlations (0·55 to 0·72) between the Witkin Embedded Figures Test and a detection task. The detection task was scored by various methods. A LATENCY score similar to that derived for the Embedded Figures Test, gave the highest correlation. Neither the Embedded Figures Test nor the detection latency test are likely to have been pure speed tests, but speed of working would have contributed to the score. The power-speed dimension appears, therefore, to be relevant to some detection tasks.

The data from the Army field trials do not substantiate the relevance of a power-speed dimension. Although the Greenbank detection task seems to have been a power test, in that exposures of more than ten seconds probably would not have allowed subjects to gain substantially higher scores, the NUMBER score did not correlate with the other power tests (i.e. the HFT and the AGC). The LATENCY score should have accentuated any speed factor that may have been present in the detection task, but it did not correlate with the HPT, which was the only speed test administered.

It was assumed, for the three experiments examined in this discussion, that a general ability factor is common to detection tasks. The data do not support this assumption. The three detection tasks appear to have a lot in common in that all involved the detection of stationary, camouflaged targets. Nevertheless, the results from the three experiments differ. Bucklin's (Ref. 3) task showed relationships between target detection and power tests of field dependence and intelligence, but did not show a relationship between target detection and a speed test of field dependence. Thornton et al (Ref. 1) demonstrated a relationship between target detection and a speed dependent test of field dependence. The data from the Greenbank trials did not show any relationship between target detection and power tests of field dependence or intelligence, or between target detection and a speed test of field dependence. Different skills seem to have been required in these tasks even though critical differences in the nature of the tasks are not readily apparent.

As an alternative to seeking a general ability factor for target detection, it may be more useful to investigate specific factors operating in particular situations. This will require a more detailed examination of detection tasks than has hitherto been the practice. If skills that are used in particular detection tasks can be recognised, progress will have been made towards finding tests that can measure them and thus measure performance on relevant detection tasks.

REFERENCES

1. Thornton, C. L. et al. Field dependence and target identification *Human Factors*, 1968, 10, 493-496.

2. Bucklin, B. L. Field Dependence and Visual Detection. Engineering Sciences Laboratory, Picatinny Arsenal, Dower, New Jersey, 1971, Tech. Report 4137.

3. Conklin, R. C. et al. Field dependence — independency and eye movement patterns. *Perceptual and Motor Skills*, 1968, 26, 59-65.

4. Bergum, B. O. and Lehr, D. J. Vigilance performance as a function of tasks and environmental variables. Human Resources Office, George Washington University, HumRRO Research Report 11, 1963.

5. Bergum, B. O. Vigilance: A guide to improved performance. U.S. Army Air Defence Human Research Unit, Fort Bliss, Texas, HumRRO Research Bulletin 10, 1963.

6. Mackworth, N. H. and Bruner, J. S. How adults and children search and recognise pictures. *Human Development*. 1970, 13, 149-177.

7. Thomas et al. A field study comparison of visual search methods in aerial observation. Paper read at meeting of American Psychological Association, 1959.

8. Banks, J. H. et al. Improved search techniques with passive night vision devices. Behaviour and Systems Research Laboratory, Arlington, Virginia. Technical Research Report 1169, 1971.

9. Cutten, D. R. Preliminary Investigations Made on a Naval Lookout Surveillance. Weapons Research Establishment, Salisbury, Technical Memo OSD 158.

10. Burg, A. Vision and driving: A report on research. *Human Factors*, 1971, 13, 79-87.

11. Johnston, D. M. The relationship of near vision peripheral acuity and far vision search performance. *Human Factors*, 1967, 9, 301-303.

12. Adams, J. H., and Kennet, R. H. Visual Standards in the Australian Military Forces: The relationship between foveal visual acuity and field performance. AAORG Report (in preparation).

13. Witkin, A. H. et al. *Psychological Differentiation*. New York, John Wiley & Sons, 1962.

14. French, J. W. et al. Manual for kit of reference tests for cognitive factors. Princeton, New Jersey, Educational Testing Service, 1963.

15. Cronbach, L. J. *Essentials of Psychological Testing* (2nd ed.) New York, Harper Bros., 1960.

16. Owens, A. G. An Item Analysis of a Modified Form of Test A.G.C. 1 Psychology Research Unit, Albert Park Barracks, Melbourne, 1970, No. 2/70.

APPENDIX 1
Hidden Figures Test

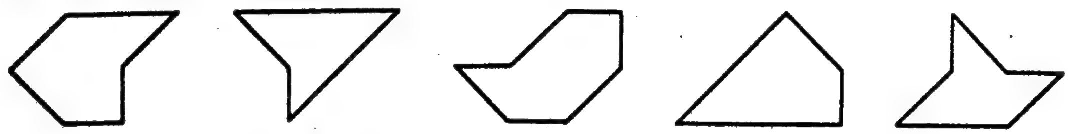
Name: ______________________________

HIDDEN FIGURES TEST — Cf-1

This is a test of your ability to tell which one of five simple figures can be found in a more complex pattern. At the top of each page in this test are five simple figures lettered A, B, C, D, and E. Beneath each row of figures is a page of patterns. Each pattern has a row of letters beneath it. Indicate your answer by putting an X through the letter of the figure which you find in the pattern.

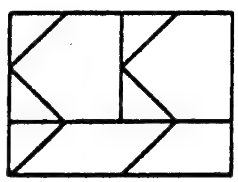
NOTE: There is only one of these figures in each pattern, and this figure will always be right side up and exactly the same size as one of the five lettered figures.

Now try these 2 examples.



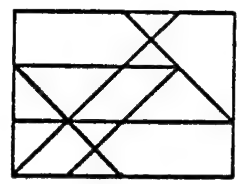
A B C D E

I



A B C D E

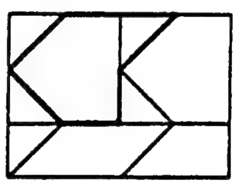
II



A B C D E

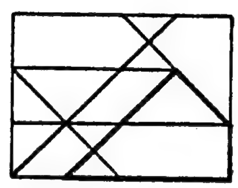
The figures below show how the figures are included in the problems. Figure A is in the first problem and figure D in the second.

I



~~A~~ B C D E

II



A B C ~~D~~ E

Your score on this test will be the number marked correctly minus a fraction of the number marked incorrectly. Therefore, it will not be to your advantage to guess unless you are able to eliminate one or more of the answer choices as wrong.

You will have 10 minutes for each of the two parts of this test. Each part has 2 pages. When you have finished Part 1, STOP. Please do not go on to Part 2 until you are asked to do so.

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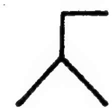
APPENDIX 2
Hidden Patterns Test

Name: ____________________

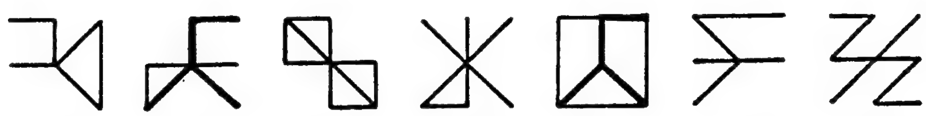
HIDDEN PATTERNS TEST — Cf-2

How quickly can you recognize a figure that is hidden among other lines? This test contains many rows of patterns. In each pattern you are to look for the model shown below:



The model must always be in this position, not on its side or upside down.

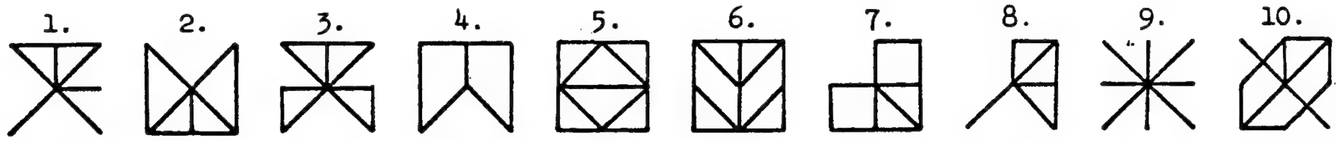
In the next row, when the model appears, it is shown by heavy lines:



( ) (X) ( ) ( ) (X) ( ) ( )

Your task will be to place an X in the space below each pattern in which the model appears. Now, try this row:

1. 2. 3. 4. 5. 6. 7. 8. 9. 10.



( ) ( ) ( ) ( ) ( ) ( ) ( ) ( ) ( ) ( )

You should have marked patterns 1, 3, 4, 8, and 10, because they contain the model.

Your score on this test will be the number marked correctly minus the number marked incorrectly. Work as quickly as you can without sacrificing accuracy.

You will have 2 minutes for each of the two parts of this test. Each part has two pages. When you have finished Part 1, STOP. Please do not go on to Part 2 until you are asked to do so.

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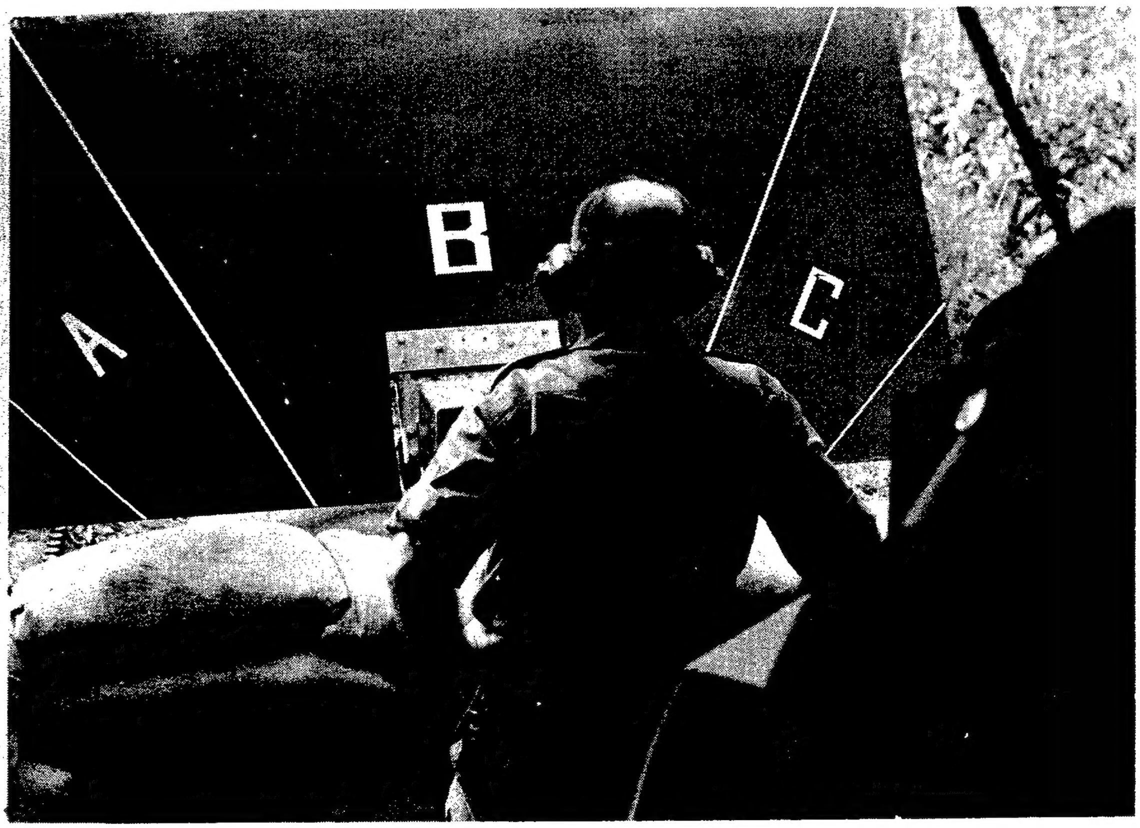
Adapted from Designs by L. L. Thurstone

TARGET AREA A, ONE TARGET RAISED, AS SEEN FROM THE VIEWING POSITION.

TARGET AREA A, NO TARGETS RAISED, AS SEEN FROM THE VIEWING POSITION.



VIEWING POSITION, SCREEN RAISED.

VIEWING POSITION, SCREEN LOWERED.

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7. Abstract

ABSTRACT

Results obtained by other experimenters have demonstrated relationships between target detection performance and field dependence and between target detection performance and intelligence. This Note reports an attempt to verify this earlier work.

During a series of field trials at Greenbank, Queensland, soldiers were set the task of detecting stationary targets in dense jungle. Their detection scores were correlated with their scores on tests of field dependence and intelligence. The data failed to support the earlier findings.

The detection tasks in this, and in two previous experiments, were similar in that stationary, camouflaged targets were used. However the detection tasks used in the two previous experiments correlated with tests of field dependence and intelligence, but the detection task used in this experiment did not. Research workers have generally assumed that a common factor contributes to performance over a wide variety of detection tasks. A general factor explanation is, however, not tenable for the data of this and other experiments. Research directed at defining factors that contribute to performance on particular detection tasks, and that can be measured independently of those tasks, may be more useful at this stage, than a search for a general target detection factor.

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